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**Westlind**

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(54) **AGRICULTURAL IMPLEMENT WITH A SCRAPER INTERNAL TO A ROLLING BASKET**

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(51) **Int. Cl.**
***A01B 29/04*** (2006.01)
***A01B 33/14*** (2006.01)

(52) **U.S. Cl.**
CPC ..... ***A01B 29/048*** (2013.01); ***A01B 29/04*** (2013.01); ***A01B 33/142*** (2013.01); *Y10T 29/27* (2015.01)

(58) **Field of Classification Search**
USPC ..... 172/68, 552; 56/DIG. 20
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | | |
|---|---|---|---|---|
| 1,249,103 | A | 12/1917 | Jansky | |
| 2,582,199 | A | 1/1952 | Gardner et al. | |
| 2,911,893 | A | 11/1959 | Archibald et al. | |
| 3,269,285 | A | 8/1966 | Lathers | |
| 3,392,791 | A | 7/1968 | Drthman | |
| 3,714,913 | A | 2/1973 | Gandrud | |
| 3,897,830 | A | 8/1975 | Van Der Lely | |
| 3,910,712 | A | 10/1975 | Guerin | |
| 4,145,823 | A | 3/1979 | Lucas | |
| 4,342,365 | A | 8/1982 | Van Der Lely | |
| 4,610,567 | A | 9/1986 | Hosking | |
| 4,919,211 | A | 4/1990 | Cope | |
| 7,143,837 | B2 * | 12/2006 | Dietrich, Sr. | A01B 29/048 172/532 |
| 9,326,439 | B2 * | 5/2016 | Westlind | A01B 29/04 |
| 2014/0262379 | A1 * | 9/2014 | Landoll | A01B 33/02 172/452 |

* cited by examiner

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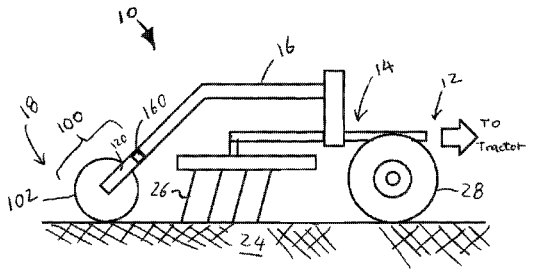
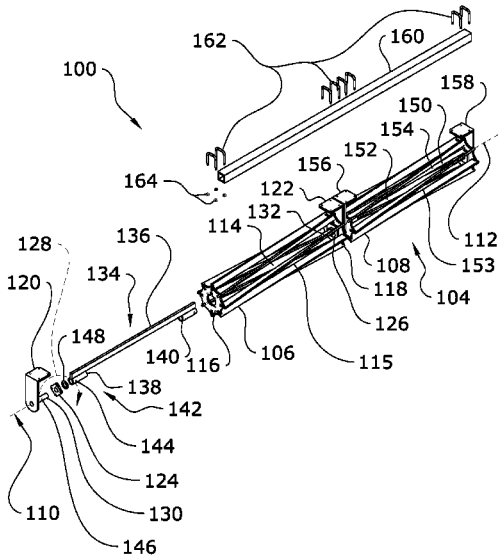
(57) **ABSTRACT**

An agricultural implement having a rolling basket. A stationary blade is disposed inside an inner chamber of the rolling basket and attached at ends of the rolling basket near the bearings that are connected to the rolling basket. The rolling basket rotates around its major axis via the bearings, while the blade is held stationary. The stationary blade has sleeves at the ends, and each of the sleeves is connected to a post of a support arm and locked into the posts via a pin.

**3 Claims, 4 Drawing Sheets**



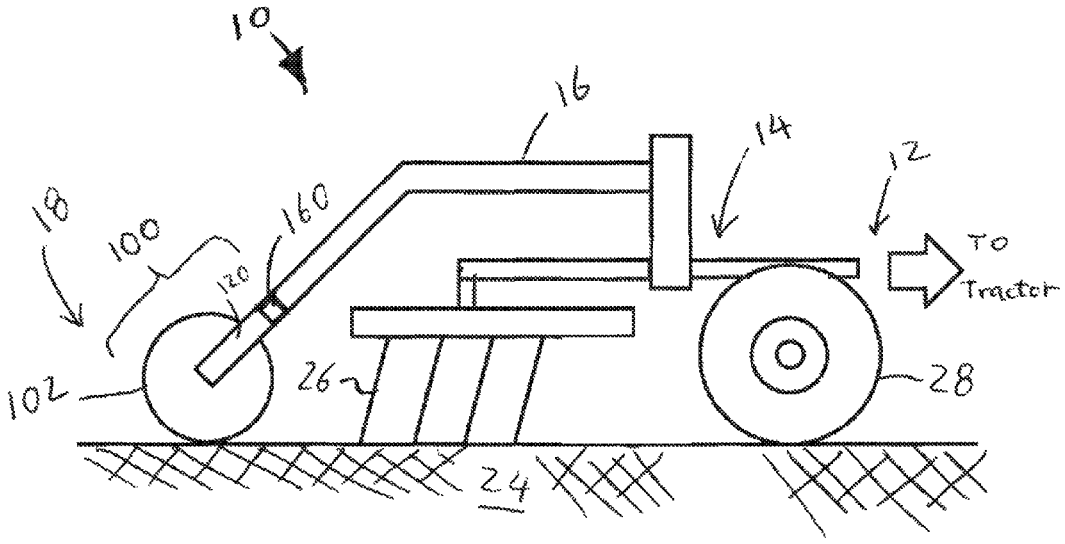



Fig. 1

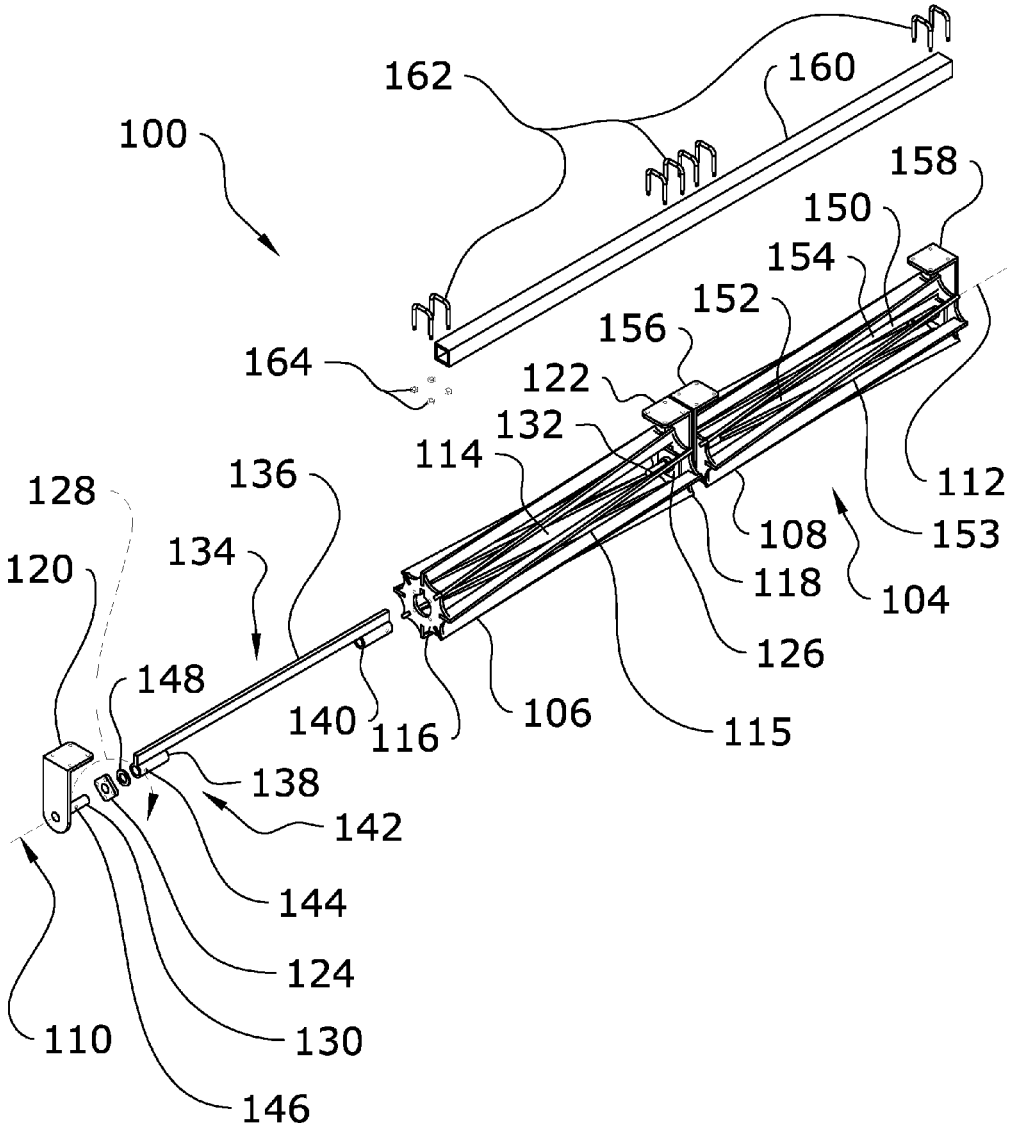

162
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FIG. 2

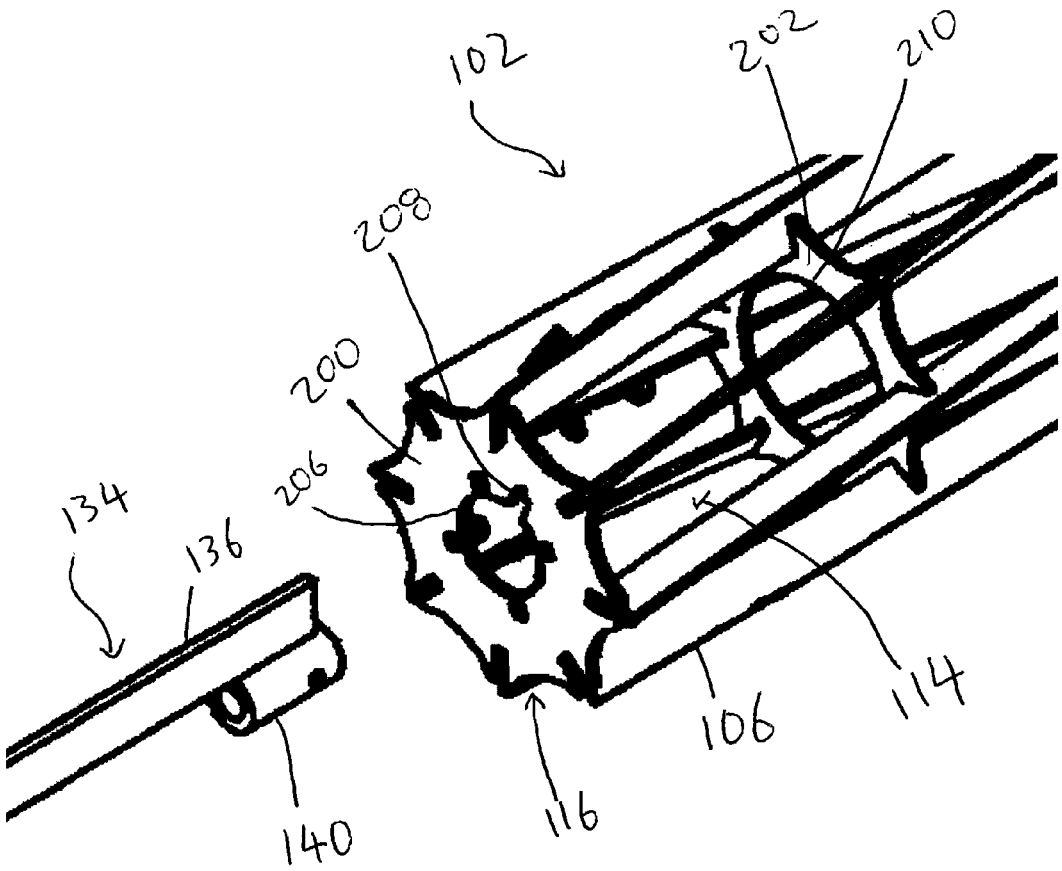


Fig. 3

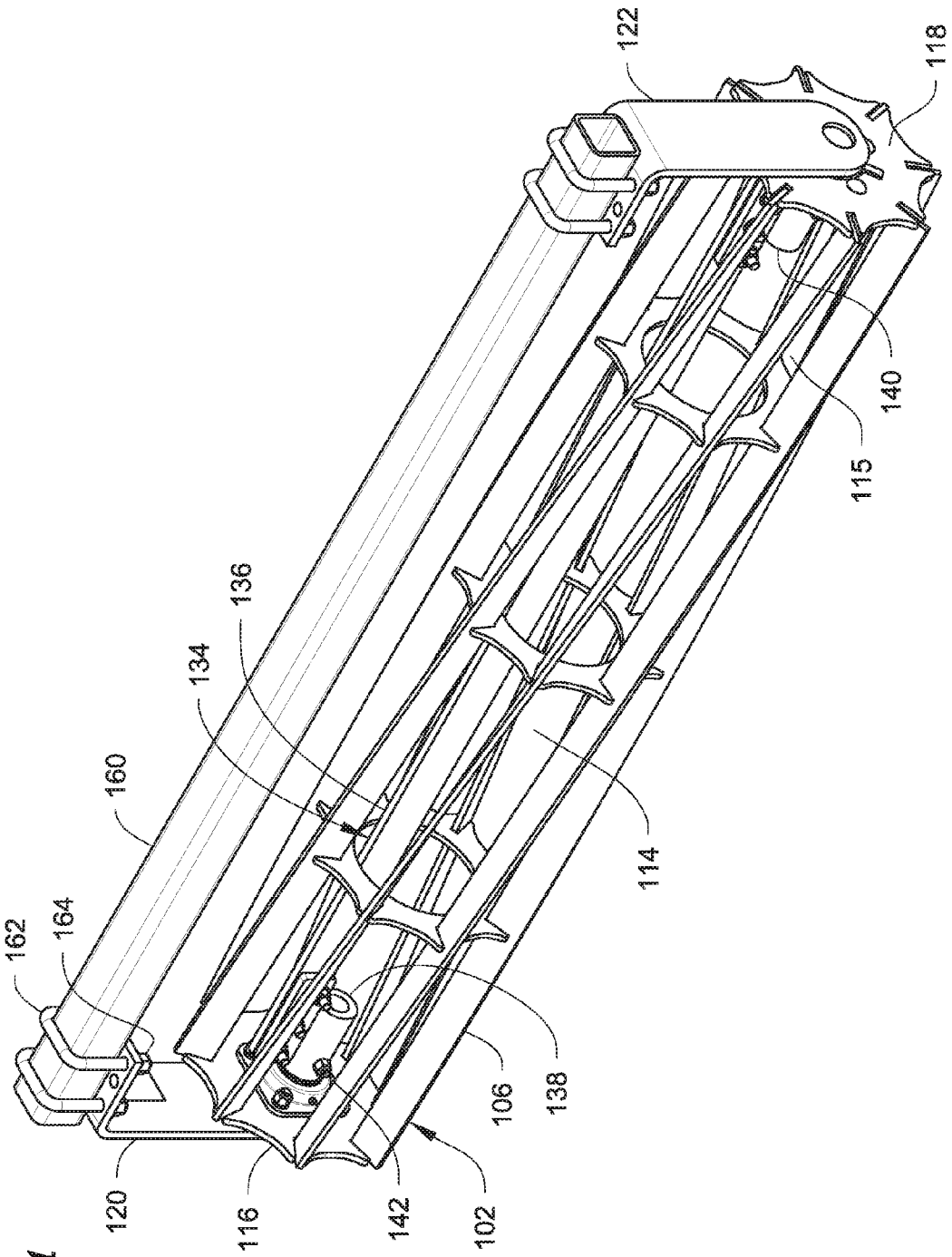


Fig. 4

# AGRICULTURAL IMPLEMENT WITH A SCRAPER INTERNAL TO A ROLLING BASKET

## FIELD

This disclosure generally relates to a rolling basket for an agricultural tillage implement for crumbling soil for agricultural use.

## BACKGROUND

An agricultural tillage implement for crumbling soil can include one or more rolling baskets. A rolling basket is commonly disposed and connected at a rear of an agricultural tillage implement for crumbling soil, firming up the soil profile, breaking up clods of soil, and/or enhance the seed bed.

## SUMMARY

An agricultural tillage implement having a rolling basket is disclosed. One or more of the rolling baskets can be attached at an end of the agricultural tillage implement after rows of disk coulters. The rolling basket functions to break up clumps of dirt.

A stationary blade is disposed inside an inner chamber of the rolling basket and attached at ends of the rolling basket near the bearings connected to the rolling basket. The rolling basket rotates around its major axis via the bearings, while the blade is held stationary. The stationary blade has sleeves at the ends, and each of the sleeves is connected to a post of a support arm and locked into the posts via a pin. The stationary blade can be a part of an internal scraper disposed inside an inner chamber of the rolling basket.

## BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the drawings in which like reference numbers represent corresponding parts throughout.

FIG. **1** illustrates a side schematic view of an embodiment of an agricultural tillage implement.

FIG. **2** illustrates a partially exploded perspective view of an embodiment of an agricultural tillage implement assembly having two rolling baskets.

FIG. **3** illustrates a close-up view of one of the rolling baskets shown in FIG. **2**.

FIG. **4** is a perspective view showing the implement in assembled form.

## DETAILED DESCRIPTION

The term "rolling basket" generally refers to a "basket roller" as used by American Society of Agricultural Engineers (ASAE) Standard Terminology and Definitions for Agricultural Tillage Implements. A rolling basket is assembled and connected to be a part of an agricultural tillage implement. The agricultural tillage implement can have one or more rolling baskets assembled thereto.

It has been discovered that conventional rolling baskets are prone to plugging in muddy or moist conditions. The present invention solves the plugging problem with an internal scraper in the rolling basket. The internal scraper (e.g. stationary blade) disrupts the flow of mud inside the inner chamber of the rolling basket. That is, the internal scraper prevents the mud from pushing into the center of the inner chamber of the rolling basket which otherwise tends to fill up the rolling basket.



FIG. **1** shows an embodiment of an agricultural tillage implement **10**, having a front **12** that is configured to connect to a puller (e.g. a tractor) (see arrow). The agricultural tillage implement **10** includes a tillage equipment assembly **14** and a support member **16**, wherein the support member **16** is directed towards a rear **18** of the agricultural implement **10** and the support member **16** is connected to and supports a rolling basket assembly **100**, which includes one or more rolling basket **102** connected to a support arm **120** connected to a support bar **160**. The tillage equipment assembly **14** has a frame **20** and various tillage equipment attached to the frame **20**. The tillage equipment assembly **14** can have one or more tillage equipment connected and assembled thereto. The tillage equipment assembly **14** which can include a harrow. The harrow can be, for example, a disk harrow, single disk harrow, a tandem disk harrow, an offset disk harrow, and/or a one-way disk harrow. FIG. **1** shows the tillage equipment assembly **14** including a plurality of teeth **26** for mixing and leveling the soil surface. The teeth **26** can be round-wire teeth, spike teeth, and/or spring teeth. Further, although not shown, the agricultural tillage implement **10** can include one or more plows, such as a chisel plow, a moldboard plow, a disk plow, a combination chisel plow, a subsoiler, a field cultivator, a row bedder, and/or a row crop cultivator. Further, although not shown, the tillage equipment assembly **14** can include a vertical tillage disc. The frame **20** includes wheels **28** to support the agricultural tillage implement **10** on the ground. The wheels **28** can be used to control a digging depth of the agricultural equipment (e.g. harrow **22** and/or teeth **26**).

FIG. **2** shows an embodiment of a rolling basket assembly **100** for an agricultural tillage implement (**10** shown in FIG. **1**) including two rolling baskets **102**, **104**. Each of the rolling baskets **102**, **104** has a generally cylindrical shape formed by a plurality of blades **106**, **108**. In other embodiments, one or more of the blades **106**, **108** can be replaced with wire rods or bars. The plurality of blades **106**, **108** of the rolling basket **102**, **104** extend from near one end along a major axis **110**, **112** of the rolling basket **102**, **104** to an opposing end of the major axis **110**, **112**, respectively. The rolling basket assembly **100** has the two rolling baskets **102**, **104** aligned so that the each of the major axis **110**, **112** are aligned and/or parallel to each other.

The rolling basket **102** has the plurality blades **106** disposed generally evenly spaced around a circumference defined by a fixed radius away from the major axis **110** thereby forming a "basket" structure. The basket structure defines an inner chamber **114** of the rolling basket **102**. The basket structure has a plurality of openings **115** connecting the inner chamber **114** to the outside of the basket structure.

The plurality of blades **106** can be straight or curved (e.g. helical) as they extend axially from one end **116** of the rolling basket **102** to an opposing end **118**. When in use, the rolling basket **102** is positioned on the ground so that its major axis **110** is substantially parallel with a surface of the ground, and the plurality of blades **106** rotate around the major axis **110** to work the soil.

The rolling basket **102** is connected to two support arms **120**, **122** via bearings **124**, **126**. The bearings **124**, **126** are connected to the rolling basket **102** at ends **116**, **118** of the rolling basket. The bearings **124**, **126** are configured to allow the rolling basket **102** to rotate around its major axis **110** (as shown by, for example, arrow **128**). The arrow **128** is not intended to limit a direction of the rotation of the rolling

basket **102**. Accordingly, the rolling basket **102** can rotate in either direction of the arrow **128**.

The support arm **120** has a post **130** configured to connect to the bearing **124**. The bearing **124** is configured to rotate around the post **130**. The support arm **122** also has a post **132** configured to connect to the bearing **126**, wherein the bearing **126** is configured to rotate around that post **132**. Thus, the rolling basket **102**, which is connected to the bearings **124**, **126** rotates around the posts **130**, **132**.

In the embodiment shown, an axial shaft for rotating the rolling basket **102** is not included in the rolling basket **102**.

An internal scraper **134** includes a stationary blade **136** connected to two sleeves **138**, **140** at each end of the stationary blade **136**. The first sleeve **138** receives the post **130**. A pin **142** can be inserted into matching openings **144**, **146** to lock the first sleeve **138** stationary with respect to the post **130**. The opening **144** is in the first sleeve **138** and the opening **146** is in the post **130**. The bearing **124** is disposed between the support arm **120** and the first sleeve **138** on the post **130**. A washer **148** can be provided between the bearing **124** and the first sleeve **138** to aid in rotation of the bearing **124** with respect to the first sleeve **138**.

Similar to the configuration of the first sleeve **138**, the second sleeve **140** receives the post **132**. A pin is inserted into matching openings of the second sleeve **140** and the post **132** to hold the second sleeve **140** stationary with respect to the post **132**. The bearing **126** is disposed between the support arm **122** and the second sleeve **140** on the post **132**. A washer can be provided between the bearing **126** and the second sleeve **140** to aid in rotation of the bearing **126** with respect to the second sleeve **140**.

The first sleeve **138** and the second sleeve **140** are configured to make the internal scraper **134** stationary when the rolling basket **102** is rotating (i.e. during operation of the rolling basket **102**). Accordingly, in addition to the pins **142** and/or as an alternative, each of the first sleeve **138** and the second sleeve **140** can have a locking structure that make the sleeves **138**, **140** stationary with respect to the to the respective posts **130**, **132**.

The rolling basket **104** is assembled similarly to the rolling basket **102**. Fully assembled, the internal scraper **150** is disposed inside the inner chamber **152** of the rolling basket **104**. The rolling basket **104** has openings **153** connecting the inner chamber **152** to the outside of the rolling basket **104**. The stationary blade **154** of the internal scraper **150** extends radially away from the major axis **112** of the rolling basket **104**. The rolling basket **104** has the stationary blade **154** extending vertically in the "up" direction, away from the surface of the ground. The internal scraper **150** is connected to the support arms **156**, **158** and is held stationary with respect to the rotating blades **108**. The rolling basket **104** is connected to bearings at each ends, similarly to the rolling basket **102** described above.

In other embodiments, the stationary blade may extend in other directions with respect to the surface of the ground. The stationary blade is never extended "down" towards the surface of the ground.

The support arms **120**, **122**, **156**, **158** are connected to a support bar, i.e. a horizontal bar **160** via, for example, a plurality of pins **162** (e.g. U-bolt) and nuts **164**. The pins **162** are inserted through openings in an upper base portion of the support arms **120**, **122**, **156**, **158** and the nuts **164** engage the pins **162** from the bottom of the upper base portion. Other means of connecting the support arms **120**, **122**, **156**, **158** are possible.

The internal scrapers **134**, **150** are fixedly positioned so that they do not rotate around the major axis **110**, **112** when the rolling baskets **102**, **104** rotate around their major axis **110**, **112**. Accordingly, when large pieces of material are introduced into the inner chambers **114**, **152** the large pieces will move towards the internal scrapers **134**, **150** by the rotating motion of the rolling baskets **102**, **104**. As the rolling baskets **102**, **104** rotate, material inside the inner chamber of the rolling baskets **102**, **104** may move up (e.g. away from the ground) with the rotating motion. As the material reaches the top of the rolling baskets **102**, **104**, the internal scrapers **134**, **150** make contact with the material and prevent the material from moving along with the rotation of the rolling baskets **102**, **104**. Thus, the internal scrapers **134**, **150** provide resistive force for the materials. The resistive force provided by the internal scrapers **134**, **150** prevents the materials from rotating with the rolling baskets **102**, **104**. Accordingly, the materials disconnect from the rolling baskets **102**, **104** and then with the aid of gravity, fall down towards the direction of the ground. The materials can contact the rotating blades **106**, **108** as they fall down and this contact can help in breaking down the materials to smaller sizes. Then, the materials are discharged (i.e. removed) via one of the openings **115** of the rolling baskets **102**, **104**.

FIG. **3** illustrates a close-up view of a portion of the FIG. **2**, near an end **116** of the rolling basket **102**. The rolling basket **102** includes the plurality of blades **106** defining the inner chamber **114** of the basket structure defined by the plurality of blades **106**. The plurality of blades **106** are connected to an outer ring plate **200** and an inner ring plate **202**. The outer ring plate **200** is located at the end **116** of the rolling basket **102** and includes a central opening **206** with a notch **208** extending in a radial direction away from a center of the outer ring plate **200**. The central opening **206** receives the sleeve **140** of the internal scraper **134** and the notch **208** receives the stationary blade **136** of the internal scraper **134** during assembly, so that the internal scraper **134** can be disposed inside the inner chamber **114** of the rolling basket **102**. The inner ring plate **202** has an inner opening **210** that has a larger diameter than the central opening **206**. Preferably, the inner opening **210** has a radius that is substantially the same as a radial distance of the notch **208**. Thus, the inner opening **210** allows the rolling basket **102** to rotate around the stationary blade **136** without the inner ring plate **202** directly contacting the stationary blade **136**.

Advantageously, a rolling basket having an internal scraper can prevent materials from getting stuck in the basket structure of the rolling basket. This can improve performance of the rolling basket (and agricultural implements that include the rolling basket). Further, the rolling basket having an internal scraper can prevent and/or reduce damage to the equipment by aiding in breaking apart large materials that can get otherwise stuck in the inner chamber of the rolling basket.

With regard to the foregoing description, it is to be understood that changes may be made in detail without departing from the scope of the present invention. It is intended that the specification and depicted embodiment to be considered exemplary only, with a true scope and spirit of the invention being indicated by the broad meaning of the claims.

What is claimed is:

**1**. An agricultural implement with a rolling basket structure for breaking and mixing a soil surface, said implement comprising a rolling basket with an inner chamber having outer ring plates at each end of the inner chamber and a scraping assembly for being disposed in the inner chamber, said implement further comprising:

Supporting arms supporting said rolling basket;

an elongated scraping edge having a first and an opposing end, said scraping edge extending between the ends of the inner chamber;

sleeves disposed at the ends of the inner chamber and fixedly connecting the ends of the scraping edge to the supporting arms; and

bearings disposed between the supporting arms and the outer ring plates, where in the bearings are configured to connect to the ends of the rolling basket to allow the rolling basket to rotate around with respect to the elongated scraping edge.

**2**. The agricultural implement according to claim **1**, wherein the outer ring plates include central opening and a notch in at least one of the central openings, said central openings receiving said sleeves to allow for rotation of said roller basket relative to said scraping edge, said notches for allowing said scraping edge to slide there through during assembly.

**3**. A method for making an agricultural implement with a rolling basket structure for breaking and mixing a soil surface, said implement comprising a rolling basket with an inner chamber having outer ring plates at each and of the inner chamber and a scraping assembly for being disposed in the inner chamber, said implement further comprising supporting arms supporting said rolling basket, an elongated scraping edge having a first end and an opposing end, said scraping edge extending between the ends of the inner chamber, sleeves connected to the ends of the scraping and disposed at the ends on the inner chamber and fixedly connecting the ends of the scraping edge to the supporting arms, and bearings are configured to connect to the ends of the rolling basket to allow the rolling basket to rotate around with respect to the elongated scarping edge, said method comprising:

providing the scraping edge with sleeved and the rolling basket with outer ring plates having central openings with at least one central opening having a notch therein;

inserting the scraping edge to the inner chamber of the rolling basket through one of the central openings and notch;

connecting the bearings and the sleeves to the supporting arms; and

connecting the bearings to the outer ring plates, wherein the rolling basket is configured to rotate around and with respect to the scraping edge.

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